CHERNOV, Yu.I., kapitant 3-go ranga

Students of the Frunze School on the Volga. Mor.sbor. 46 no.2:30-31 F '63. (MIRA 16:2)

1. Vybshiy komandir vzvoda 62-y strelkovoy brigady.
(World War, 1939-1945--Personal narratives)

L 07457-67 EWT(1) IJP(c)

ACC NR: AP6034936 (A) SOURCE CODE: UR/0146/66/009/005/0003/0007

AUTHOR: Sazonov, A. M.; Belonogov, A. M.; Grigor'yev, S. B.; Strakhov, N. B.; Chernov, Yu. L.

ORG: Leningrad Electrotechnical Institute im. V. I. Ul'yanov (Lenin) (Leningradskiy elektrotekhnicheskiy institut)

TITLE: Spectrometer for the study of broad lines of nuclear magnetic resonance

SOURCE: IVUZ. Priborostroyeniye, v. 9, no. 5, 1966, 3-7

TOPIC TAGS: spectrometer, nuclear magnetic resonance

ABSTRACT: An all-purpose nuclear magnetic resonance spectrometer has been developed for qualitative and quantitative analysis of isotopic concentrations, for the study of ultrasonic resonance absorption in the nuclei of some alkali halide crystals, and for structural measurements of natural compounds. The device incorporates commercial-type components (see Fig. 1). The NMR detector includes crossed coils and direct absorption detectors which provide high sensitivity, and a broad range of hf field intensities. The detector can register the absorption signal or dispersion signal

Card 1/2 UDC: 535.322.2

L 07457-67

ACC NR: AP6034936

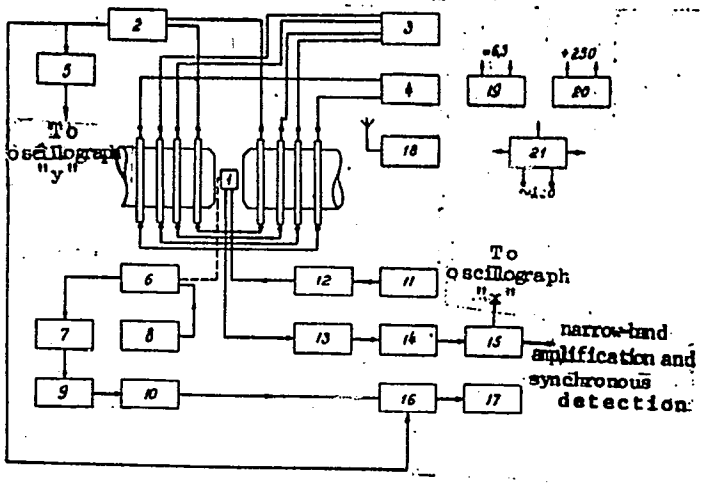

Fig. 1. Block diagram of nuclear magnetic resonance spectrometer

1 - NMR sensor; 2 - audio generator; 3 - device providing linear variation of magnetic field; 4 - current stabilizer; 5 - phase inverter; 6 - block of NMR detector; 7, 13 - hf amplifiers; 8, 14 - detector and voltmeter; 9 - calibrator; 10, 15 - audio amplifier; 11 - 5.2-mc crystal-controlled oscillator; 12 - power amplifier; 16 - synchronous detector; 17 - recorder; 18 - wave meter; 19, 20 - power sources; 21 - ferromagnetic stabilizer.

separately without distortion. The frequency range of the detector is 1—43 mc. Orig. art. has: 3 figures.

SUB CODE: 20 / SUBM DATE: 25Aug65/ ORIG REF: 003/ OTH REF: 001/ ATD PRESS: 5104

Card 2/2

25102
S/181/61/003/009/036/039
B108/B138

24,7500

AUTHORS: Chernov, Yu. M., Stepanov, A. V.

TITLE: Temperature dependence of the elastic constants of lithium fluoride single crystals

PERIODICAL: Fizika tverdogo tela, v. 3, no. 9, 1961, 2872-2874

TEXT: The authors continued previous studies (A. V. Stepanov, I. M. Eydus. ZhETF, 29, 669, 1955 and S. P. Nikanorov, A. V. Stepanov. ZhETF, 37, 1814, 1959). Young's modulus E and the shear modulus G of LiF single crystals cut in the [100] and [110] directions were measured by the oscillator method described in the papers cited above. Density was 2.60 g/cm^3. The measurements were made with longitudinal and torsional oscillations between room temperature and 500°C. The resonance frequency was determined with an accuracy of 0.05%. The relative error in measuring the elastic constants $S_{11} = \frac{1}{E_{[100]}}$, $S'_{11} = \frac{1}{E_{[110]}}$, and $S_{44} = \frac{1}{G_{[100]}}$ amounted to about

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Temperature dependence of the elastic ...

3%. The error in determining the constant $S_{12} = 2S'_{11} - S_{11} - \frac{1}{2}S_{44}$ and the compressibility $\chi = 3(S_{11} + 2S_{12})$ was greater. The thermal-expansion data were taken from Ref. 5. The results of the measurements are presented in Table 1. They agree with those given in Ref. 6 (C. Suss. C. r. Akad. Sci., 1958, 247, no. 16, 1174). Extrapolation of the nearly linear temperature dependence of $E_{[100]}$, $E_{[110]}$, and $G_{[100]}$ to absolute zero and to melting point gives the values shown in Table 2. The following conclusions are drawn: 1) The elastic constants of LiF are highly temperature dependent. 2) The character of the elastic anisotropy is maintained throughout the entire temperature range between absolute zero and melting point. There are 1 figure, 2 tables, and 7 references: 2 Soviet and 5 non-Soviet. The 3 references to English-language publications read as follows: L. Hunter, S. Siegel. Phys. Rev., 61, 84, 1942; L. Balamuth. Phys. Rev., 45, 715, 1934; C. V. Briscoe, C. F. Squire. Phys. Rev., 106, 1175, 1957.

Card 2/4

S/181/61/003/009/036/039
B108/B138

Temperature dependence of the elastic ...

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR Leningrad (Institute of Physics and Technology imeni A. F. Ioffe of the AS USSR Leningrad)

SUBMITTED: May 15, 1961

Card 3/4

24.4400

6725/

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SOV/20-129-4-13/68

AUTHOR: Chernov, Yu. P.

TITLE: The Steady Rotation of Cosmic Gas Masses in the General Relativity Theory

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 4, pp 762-765 (USSR)

ABSTRACT: The author here investigates a gas mass filling the entire space, which rotates steadily round its own axis in its own gravitational field. This rotation is considered to be adiabatic. The natural density of the rest mass ρ^*, the pressure p and the classical velocity of motion of the gas on the parallels of latitude v_φ in infinity tend towards zero with sufficient velocity. The origin of the cylindrical system of coordinates agrees with the center of mass O and the z-axis agrees with the rotational axis. To the assumption of steadiness, the axial symmetry of rotation, and to the distribution of the state parameters of the gas, there corresponds for an interval in the four-dimensional Riemann space an expression of the form

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The Steady Rotation of Cosmic Gas Masses in the General Relativity Theory

$-ds^2 = g_{oo}dx^{o2} + 2g_{o2}dx^o dx^2 + g_{11}dx^{1^2} + 2g_{13}dx^1 dx^3 + g_{22}dx^{2^2} +$

$+ g_{33}dx^{3^2}$. Here $x^o = ct$, $x^1 = l$, $x^2 = \varphi$, $x^3 = z$ holds, c - velocity of light. The present paper aims at determining the components of the metric fundamental tensor $g_{ik}(x^1,x^3)$ (i,k=0,1,2,3) of the pressure $p(x^1,x^3)$ and the rotational velocity $v_\varphi(x^1,x^3)$ as well as of the given density distribution $\varrho(x^1,x^3)$. The covariant components of the metric tensor have the form

$$g^{ik} = \begin{pmatrix} g^{oo} & 0 & g^{o2} & 0 \\ 0 & g^{11} & 0 & g^{13} \\ g^{2o} & 0 & g^{22} & 0 \\ 0 & g^{31} & 1 & g^{33} \end{pmatrix}$$

Next, the contravariant and the covariant components of four-dimensional velocity and of the classical rotational velocity are written down. The energy-momentum tensor of the field has the form

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The Steady Rotation of Cosmic Gas Masses in the General Relativity Theory

$T_i^k = wu^k u_i + p\delta_i^k$ $(w = \varrho c^2 + p)$. Two of the four relativistic Euler equations are satisfied identically, and the two others are explicitly written down. Einstein's gravitational equations are solved by employing the method of successive approximation. The time ct and the longitudinal angle φ automatically proved to be harmonic coordinates. The components of the metric fundamental tensor are set up as series with respect to the small parameter c^{-1}. By substitution of these ansatzes into the gravitational equations and by a comparison of coefficients a number of systems of equations is obtained. Next, the equations resulting in first approximation as well as the expressions for the Newtonian potential and the vector potential of gravitation are written down. If the components of the metric tensor in the Cartesian system of coordinates in first and second approximation are known, they can be written down without any difficulties also in the Cartesian system of coordinates. Five equations are obtained for the five quantities

p, v_φ, w_φ, $h_{oo}^{(2)}$ and for the given function ϱ. In first approximation the following is obtained for p and v_φ :

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The Steady Rotation of Cosmic Gas Masses in the General Relativity Theory

$$p^{(1)} = -\int_{-\infty}^{z} \varrho \frac{\partial V}{\partial z} dz; v_{\varphi}^{(1)} = \pm\sqrt{\frac{1}{\varrho}\frac{\partial p^{(1)}}{\partial l} + 1\frac{\partial V}{\partial l}}$$, and in second approximation $p^{(2)} = p^{(1)} + c^{-2}\int_{-\infty}^{z} B^{(1)} dz$, $v_{\varphi}^{(2)} = v_{\varphi}^{(1)} - \frac{1}{2}c^{-2}\frac{A^{(1)}}{v_{\varphi}^{(1)}}$.

In this manner it is possible to determine any approximation $g_{ik}^{(n)}$, $p^{(n)}$, $v_{\varphi}^{(n)}$ from the given density ϱ. It is further said that the author thanks Professor F. I. Frankl' for useful advice. There are 6 references, 5 of which are Soviet.

ASSOCIATION: Kabardino-Balkarskiy gosudarstvennyy universitet (Kabardino-Balkarskiy State University)

PRESENTED: July 9, 1959, by L. I. Sedov, Academician

SUBMITTED: July 7, 1959

Card 4/4

CHERNOV, Yu. P., Cand Phys-Math Sci -- (diss) "Established trends in the general theory of relativity." Kazan', 1960. 8 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Kazan' Order of Labor Red Banner State Univ im V. I. Ul'yanov-Lenin); 150 copies; price not given; (KL, 30-60, 136)

L 41137-65 EWI(1)/EWG(v) Pe-5/Pae-2 IJP(c) GM
ACCESSION NR: AR4046880 S/0124/64/000/009/B047/B047

15
B

SOURCE: Ref. zh. Mekhanika, Abs. 9B281

AUTHOR: Chernov, Yu. P.

TITLE An axiosymmetrical problem on steady rotation of cosmic gaseous masses in the general theory of relativity

SITED SOURCE: Izv. AN KirgSSR. Ser. yestestv. i tekhn. n., v. 5, no. 6, 1963, 1-87

TOPIC TAGS: general relativity theory, cosmic gaseous mass, gaseous mass rotatio gas density distribution, Einstein equation, Euler relativistic equation, metric tensor

TRANSLATION: Newtonian and post-Newtonian approximations to Einstein's equation are employed to determine the gravitational field, pressure and tangential velocity of rotation for a given axiosymmetrical distribution of density in a steadily rotating gaseous mass. Metric tensor elements determining the Newtonian gravitational potential are found from the gas density distribution in the first approximation to Einstein's equation. The second approximation is then attempted by nor

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L 41137-65

ACCESSION NR: AR4046880

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mal methods through tangential velocity and density. The derived corrections to metric tensor elements make it possible to write the first and second approximations to Euler's relativistic equation, the latter defining pressure, tangential velocity and corrections to these values. Bibl. with 12 titles. V. Ts. Gurovich

SUB CODE: ME ENCL: 00

Card 2/2

L 39693-65

ACCESSION NR: AP5006686 S/0219/65/059/002/0050/0054

14
AUTHOR: Chernova, G. G.; Kirzon, M. V.; Safonov, V. A.; Lebedinskiy, A. B. B

TITLE: The role of reflexes from the sinocarotid zone in the regulation of respiration under excessive intrapulmonary oxygen tension

SOURCE: Byulleten' eksperimental'noy biologii i meditsiny, v. 59, no. 2, 1965, 50-54

TOPIC TAGS: respiration, respiratory system, neurophysiology

ABSTRACT: The manner in which occlusion of the common carotid arteries and denervation of the sinocarotid area affect respiration in cats under excessive intrapulmonary tension (30 mm Hg) was studied. Occlusion of the common carotid arteries caused a reduction in the respiration retention occurring in response to the creation of excessive intrapulmonary oxygen tension, while denervation of the sinocarotid area caused an increase in this tension. In the case of increased pulmonary oxygen tension, occlusion of the common carotid arteries and denervation of the sinocarotid zone had no appreciable effect on the time of respiratory arrest.

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L 39693-65

ACCESSION NR: AP5006[illegible]86

It was concluded that the reflexes from the sinocarotid area had an activating effect on respiration under conditions of excessive intrapulmonary tension. Orig. art. has: 2 figures, 1 table.

ASSOCIATION: Kafedra fiziologii zhivotnykh Moskovskogo gosudarstvennogo universiteta imeni M. V. Lomonosova (Department of Physiology of Animals, Moscow State University)

SUBMITTED: 16May64 ENCL: 00 SUB CODE: LS, PH

NO REF SOV: 005 OTHER: 005

Card 2/2

TEREKHOVA, Yu.P.; MARININA, K.M.; SUKHORUKOVA, L.L.; CHERNOV, Yu.P., kand. fiz.-mat. nauk, otv. red.

[Programming methods for the "Minsk-1" computer] Metodika programmirovaniia na mashine "Minsk-1". Frunze, Ilim, 1965. 113 p. (MIRA 18:12)

CHERNOV, Yu.S.; ASTAPENKO, P.D.

Orographic clouds. Inform. biul. Sov. antark. eksp. no.19:51-54 '60. (MIRA 13:9)

(Antarctic regions—Cloud physics)

CHERNOV, Yu.T., inzh.

Construction of a shop with a span of 40 m. in the Federal Republic of Germany (from "Beton und Stahlbetonbau," no.3, 1962). Prom. stroi. 40 no.9:62-64 '62. (MIRA 15:11)
(Germany, West--Precast concrete construction)

CHERNOV, YU. V.

CHERNOV, Yu. V. --"The Question of the Resistance to Motion in Natural Waterway Currents." *(Dissertations For Degrees In Science And Engineering At USSR, Higher Educational Institutions). (34). Acad Sci Uzbek SSR, Inst of Structures, Tashkent, Press of the Acad Sci Uzbek SSR, 1955

SO: Knizhnaya Letopis' No. 34, 20 August 1955

* For the Degree of Doctor of Technical Sciences

CHERNOV, Yu. V.

124-11-12687

Translation from: Referativnyy Zhurnal, Mekhanika, 1957, Nr. 11, p 51 (USSR)

AUTHOR: Chernov, Yu. V., and Topchevskiy, B. A.

TITLE: On Empirical Formulas for the Mean Velocity of Liquids in Open-Channel Flow. (Ob empiricheskikh formulakh sredney skorosti dvizheniya zhidkosti v ruslovykh potokakh)

PERIODICAL: Tr. In-ta nefti, A N KazSSR, 1956, Nr 1, pp 76-87

ABSTRACT: The authors have collected and analyzed various empirical formulas, known in the literature, for the mean velocity of liquids in open-channel flow, all of which do not contain any roughness term, namely, the formulas of Chézy-Brahms, Gerlacher, Sribnoy, Haessle, Hermanek, Humphries and Abbott, Christin, Matakevich, and Linboe.

On the basis of an analysis of the formulas of Kuznetsov, Nikuradze, and Zheleznyakov, the Authors deduce their own formula for C which also does not contain any roughness parameter and replaces it with the inclination, mean depth, and coordinate of the mean velocity. The comparison of the results of the computation of C according to the formula proposed by the A.'s and according to the abovelisted earlier formulas is shown graphically (unfortunately, there is no identification

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124-11-12687

On empirical formulas for the mean velocity of liquids in open-channel flow (cont.)

of the curves and formulas). The Authors have arrived at the conclusion that the expression for C according to Chézy for open-channel flow can be transformed into the expression offered by the Authors, but that none of the empirical formulas coincide fully with that expression. The A.'s define the limitations of the applicability of the empirical formulas.

A. M. Latyshenkov

Card 2/2

SOV/124-57-9-10315

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 9, p 60 (USSR)

AUTHOR: Chernov, Yu. V.

TITLE: On the Velocity Distribution in Natural Open-channel Flows (K voprosu o raspredelenii skorostey v yestestvennykh ruslovykh potokakh)

PERIODICAL: Tr. In-ta nefti. AN KazSSR, 1956, Vol 1, pp 88-99

ABSTRACT: Cross-section characteristics of the various forms of open-channel flow are discussed (the relationship of the mean velocity over the entire cross section or along its axial normal to the maximum velocity). The author concludes that, for the time being the velocity distribution is not an accurately defined function of the depth across the cross section and of the corresponding roughness. He confirms this by a series of measurements and by a critical analysis of semi-theoretical propositions (Russian and foreign). Bibliography: 10 references.

V. N. Goncharov

Card 1/1

SOV/124-58-1-890

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 119 (USSR)

AUTHOR: Chernov, Yu. V.

TITLE: Some Laws Governing the Uniform Motion of a Liquid in Open-channel Flows Carrying Sediments (Nekotoryye zakonomernosti ravnomernogo dvizheniya zhidkosti v ruslovykh potokakh, vlekushchikh nanosy)

PERIODICAL: Tr. In-ta nefti AN KazSSR, 1956, Vol 1, pp 100-113

ABSTRACT: The author obtains a formula for the mixing length on the basis of the following assumptions relative to the structure of the flow: The mean-square deviation of the vertical component is assumed to be constant; the vertical scale of the eddies, which is determined as the ratio of the mean-square deviation of the vertical velocity to the mean-velocity gradient, is assumed to be proportional to the distance from the wall; the square of the mean-square deviation of the longitudinal velocity is assumed to vary according to a linear law. The integration of the Prandtl equation for the mixing-length relationship thus obtained relative to the coordinates leads to a logarithmic curve of the Yasmund-Nikuradze type. On the basis of that curve the author then analyzes the structure of the Chézy coefficient and shows that

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Some Laws Governing the Uniform Motion of a Liquid (cont.)

the latter can be expressed as some function of Karman's $\varkappa$ constant and a certain geomorphological channel-bed characteristic ϕ. The values of $\varkappa$ and ϕ for open-channel flows are determined by means of an analysis of high-speed river-flow observations [Zheleznyakov, G. V., Gidravlicheskoye obosnovaniye metodov rechnoy gidrometrii (Hydraulic Foundation of the Methods of River Hydrometry). Izd-vo AN SSSR, 1950]. In conclusion the author adduces empirical formulas for the relationship between the slope and the roughness of the bottom for open-channel flows. Bibliography: 14 references.

Ye. M. Minskiy

Card 2/2

CHERNOV, Yu.V.

Approximate equations of the length of disturbance and lateral scale of turbulence. Uch. zap. Mord. gos. un. no.15 pt.2:62-67 '63. (MIRA 18:6)

CHERNOV, Yu.V.

Study of rising air currents by means of gliders. Trudy TSAO no.63:70-76 '65. (MIRA 18:8)

CHERNOV, Z. S.

"The Spiration - a Centrifugal Electrostatic Focusing Traveling-Wave Tube," a paper presented at the International Conference on Microwave Tubes, Paris, 29 May to 2 Jun 1956

B-99309, 30 Aug 56

CHERNOV, Z. S.

CARD 1 / 2 PA - 1530

SUBJECT USSR / PHYSICS
AUTHOR Author not mentioned.
TITLE The Scientific All Union Session (held in connection with "Broadcasting Day").
PERIODICAL Radiotechnika, 11, fasc. 9, 74-79 (1956)
Issued: 19.10.1956

Z.S. ČERNOV delivered a report concerning the results obtained on the occasion of the investigation of spiratrons, which are new tube-type devices with propagating waves and electrostatic focussing of electron currents.

E.D. NAUMENKO spoke about the results obtained by the working out of laboratory models of reflecting klystrons for measuring purposes.

V.A. KLJAZKIN discussed the compensation method of coping with impulse disturbances in a wireless set. He also described ways and means for the practically complete elimination of impulse disturbance by compensation methods.

B.I. RASSADIN pointed out the experimentally confirmed advantages of a signal transmission in a frequency band in four-channel systems in radio telephone- and telegraph communication. He recommended a method by means of which nonlinear distortion can be considerably diminished.

A.P. ANGAFOROV demonstrated two basic principles of construction as well as the construction of television tubes for the production of a direct representation of the image: A three-ray tube with a darkening mask and a mosaic-pattern

luminescent screen (of the Kolortron type) and a one-ray tube with a control net and a striped luminescent screen (of the Chromatron type).

A.D. ASATIAN described the characteristic of tube types such as are used in Western Europe and the USA for broadcasting- and television sets, and he gave a survey of the new Sovietic "finger-tubes" for television- and radio sets.

A.K. BEKTABEGOV reported on the new piezoceramic pickup which offers a number of advantages.

A.G. MURADIAN analyzed the working of amplifiers in semiconductor devices with series- and parallel back-coupling.

B.A. KRASJUK described the experimental examination of the modification of the magnetic properties of alloys of the "Permalloj" type under the influence of gamma rays.

INSTITUTION:

SOV/112-57-6-13015

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 6, p 194 (USSR)

AUTHOR: Chernov, Z.

TITLE: The First International Congress on SHF Electronics
(Pervyy Mezhdunarodnyy kongress po elektronike sverkhvysokikh chastot)

PERIODICAL: Novoye vremya, 1956, Nr 38, pp 26-29

ABSTRACT: Bibliographic entry.

Card 1/1

CHERNOV, Z. S.

"Systems With Centrifugal-Electrostatic Focusing of an Electron Beam," by Z. S. Chernov, Institute of Radio Engineering and Electronics, Academy of Sciences USSR, Radiotekhnika i Elektronika, No 11, Nov 56, pp 1428-34

The author describes a new electrostatic system for forming and focusing an electron beam with spiral movement of the electrons. The device is called "Spiratron," and is a combination of a traveling wave tube and a two-beam amplifier, which does not require magnetic focusing of the electron beam. The basic component of a spiratron is an electron-optical system, consisting of an electron gun, which forms a ribbon-like electron beam. The electron beam is injected at an angle to the axis of the tube into a space between the two concentric cylinders, one of which acts as an electron decelarating device. Leaving the electron gun, the beam has both axial and tangential components of velocity, and moves in a helical trajectory. The experiment was conducted at frequencies of from 100 to 4,500 Mc. A well-defined electron beam of 300-400 milliamperes per sq cm current density was obtained.

The article brings out a number of advantages and possibilities of the centrifugal-electrostatic focusing of an electron beam.

This report was originally presented at the International Congress of High-Frequency Devices, Paris, 2 June 1956.

Sum 1258

CHERNOV, Z.S.

AUTHOR: CHERNOV,Z.S., BYERNASHEVSKIY,G.A. PA - 2491

TITLE: Some Problems of the Electronics of Superhigh Frequencies. (Nyekotoryye problemy elektroniki svyerchvysokikh chastot, Russian)

PERIODICAL: Vestnik Akademii Nauk SSSR, 1957, Vol 27, Nr 2, pp 43-49 (U.S.S.R.)

Received: 5 / 1957 Reviewed: 6 / 1957

ABSTRACT: This paper describes devices which are used for the production of radio tubes for propagated waves. The slowing-down structures in which electromagnetic waves are given a phase velocity that is inverse to the propagation of the waves, are dealt with. There follows a description of other devices for superhigh frequencies which are constructed on the principle of continuous interaction. The application of radiolocation, the construction of radio relay stations, which have already been in use in France, England, Italy, and Japan is described and met with considerable interest in the U.S.S.R. In accordance with the regulations issued by the XX. Party Congress it is intended to build no less than 10.000 km of radio relay lines within the next 5 years. Also the application of the aforementioned tubes for electron computors etc. is discussed. The paper further deals with new systems of forming electron bundles in accordance with the method developed by the American scientist D. PEERS, upon the basis of which the Russian scientist

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PA - 2491

Some Problems of the Electronics of Superhigh Frequencies.

B.T. OVCHAROV intends to develop a method which would make it possible to determine the exterior fields of electron flux. Furthermore, the idea of the "soundless cathode" is discussed.

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

Card 2/2

CHERNOV, Z. S.

(Acad. Sci. USSR)

"Interaction of electromagnetic waves and electron beams in centrifugal electrostatic focusing systems,"

paper to be presented at the Intl. Symposium on Electronic Waveguides," Polytechnic Inst. of Brooklyn, New York, 8-10 April 1958

Advance program

SOV/30-58-7-10/49

AUTHORS: Chernov, Z. S., Bernashevskiy, G. A.

TITLE: Symposium on "Electronic Waveguides" in the USA (Simpozium po "elektronnym volnovodam" v SShA)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 7, pp. 92 - 95 (USSR)

ABSTRACT: The Symposion on Basic Problems of Super-High Frequency of Electronics took place in New York (N'yu-Iork) from April 8 to April 10. The reports delivered comprised communications on various types of SVCh amplifiers. Such amplifiers also are the subject of the work of Soviet scientists, N.G.Basov, A.M. Prokhorov, M.Ye.Zhabotinskiy and others with the purpose of obtaining amplifiers with extremely low set noises. The Soviet scientists delivered 2 reports: Z.S.Chernov described the characteristic features of the interaction of electromagnetic waves with electronic currents in systems with centrifugal-electrostatic focusing. G.A.Bernashevskiy spoke on results obtained by a versatile investigation of electronic two-ray wave systems. The round table discussion which took place at the end

Card 1/2

SOV/109-3-10-1/12

AUTHOR: Chernov, Z.S.

TITLE: Methods of Focusing Electron Beams in Modern Ultra High-frequency (Microwave) Devices (Metody fokusirovki elektronnykh potokov v sovremennykh priborakh sverkhvysokikh chastot)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 10, pp 1227 - 1242 (USSR)

ABSTRACT: The existing systems of focusing the electron beams can be classified as homogeneous and periodic. In the first class of the devices, the focusing fields which compensate the Coulomb forces are constant along the beam, whereas the second class ensures the required configuration of the beam by passing it through a periodic system of magnetic or electrostatic lenses or mirrors. The focusing systems can also be divided into magnetic and electrostatic or combined devices. The classification can be illustrated by means of a diagram, such as shown in Figure 1. In the figure, all the homogeneous systems lie to the right of the line A-A and periodic systems to the left of the line. On the other hand, the magnetic methods are situated below the line B-B and the electrostatic ones above the line. The following individual systems are shown in this figure:

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Methods of Focusing Electron Beams in Modern Ultra High-frequency (Microwave) Devices

1) longitudinal magnetic field (Brillouin beam); 2) centrifugal, electrostatic focusing; 3) Harris and Crumly system; 4) periodic electrostatic focusing; 5) the Chang system; 6) "Slalom" beam; 7) periodic magnetic focusing; 8) focusing by auxiliary fields; 9) "meander" beam and, finally, ionic focusing. The method of employing a longitudinal magnetic field is the simplest and consists of employing a strong field in order to equalise the electron trajectories. The Brillouin beam (Ref 1) is a development of this system; in this case, an electron beam having a circular cross-section is rotated around the axis whose direction is parallel to the magnetic field (see Figure 2). This method permits the focusing of electrons by employing comparatively low fields but there are practical difficulties in constructing appropriate focusing systems. The centrifugal, electrostatic focusing system is based on the use of a helical electron gun (Figure 3) and a pair of helical focusing electrodes; it also contains a cylindrical anode and a focusing central

conductor. The Harris-Crumly system employs a hollow, cylindrical electron beam (Figure 5) which is formed in a magnetically screened cone; the beam is then introduced into the field of a cylindrical condenser. The periodic focusing systems can be either magnetic or electrostatic. The classical, periodic, electrostatic focusing system (Figure 6) is very simple. This device is, however, rather ineffective in ultra high-frequency applications. An improved, electrostatic, periodic focusing system was proposed by Chang and this is based on a rotating beam of the type similar to that of the Harris-Crumly system. The centrifugal force is balanced by the focusing force of a periodic, electrostatic field which is produced by a double helix (Figure 7). The second system, which employs the principles of periodic and centrifugal electrostatic focusing, is that due to Kompfner (Ref 22). This is the so-called "Slalom" beam (Figure 8), where the two systems of electrodes form the integral part of a slow-wave structure. Figure 9 shows a magnetic, periodic, focusing device which consists of a number of magnetised rings which produce an almost sinusoidal field distribution along the axis of the

AUTHORS: Chernov, Z. S., Bernashevskiy, G. A.

TITLE: Symposium on "Electronic Waveguides" in the USA (Simpozium po "elektronnym volnovodam" v SShA) SOV/30-58-7-18/49

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 7, pp. 92 - 95 (USSR)

ABSTRACT: The Symposion on Basic Problems of Super-High Frequency of Electronics took place in New York (N'yu-Iork) from April 8 to April 10. The reports delivered comprised communications on various types of SVCh amplifiers. Such amplifiers also are the subject of the work of Soviet scientists, N.G.Basov, A.M. Prokhorov, M.Ye.Zhabotinskiy and others with the purpose of obtaining amplifiers with extremely low set noises. The Soviet scientists delivered 2 reports: Z.S.Chernov described the characteristic features of the interaction of electromagnetic waves with electronic currents in systems with centrifugal-electrostatic focusing. G.A.Bernashevskiy spoke on results obtained by a versatile investigation of electronic two-ray wave systems. The round table discussion which took place at the end

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of the symposion, in the course of which a number of interesting data on the recent achievements in these fields was revealed, excited great interest. Some of the leading research laboratories of the USA (SShA) were visited after the end of the symposion. The Soviet Delegates stated that their participation in the symposion was very useful. The hospitality of the American scientists who enabledthe Soviet Delegates to familiarize themselves with a number of interesting investigations and to acquaint themselves with various aspects of life in the USA, was also underlined.

system. In many cases, the requirements of ultra high-frequency devices can be satisfied by combining both electrostatic and magnetic, periodic, focusing devices. By this means, it is possible to increase the period of the focusing structure so that it becomes practicable. An interesting periodic, focusing device was proposed by H. Alfven (Ref 30). This is illustrated in Figure 12; the system employs a magnetic field which is perpendicular to the axis of the device. The ionic focusing has been known for a long time and has been regarded as more of a nuisance than a useful device. The method is based on the fact that positive ions, when introduced into an electron beam, compensate the negative space charge of the electrons. In this way, the very cause of the Coulomb forces is eliminated. It is thought that further investigation of this field is necessary and that it may offer some useful possibilities. The results of the survey of the above focusing systems are summarised by means of various graphs in Figures 13 and 14.

Methods of Focusing Electron Beams in Modern Ultra High-frequency (Microwave) Devices

Figure 13 shows the focusing and de-focusing forces as a function of the radial displacement of an electron for the following systems: A - Brillouin beam, B - a magnetically controlled beam, B - a periodic, electrostatically focused system with rotating hollow beam and G - the system of centrifugal, electrostatic focusing; Curve 1 represents the centrifugal force; Curve 2 illustrates the de-focusing force of the space charge or the focusing force of a cylindrical condenser; Curve 3 gives the focusing force of the longitudinal, magnetic field, while Curve 4 shows the focusing force of a periodic, electrostatic system. Figure 14 illustrates the dependence of the restoring force on the radial displacement of an electron. From the figures, it is concluded that the sharpness of the Brillouin beam and that of the centrifugal, electrostatic focusing are almost the same, whereas the focusing by longitudinally magnetic field is slightly sharper. The rotating beams in a periodic, electrostatic system have the highest focusing sharpness.

SOV/109-3-10-1/12

Methods of Focusing Electron Beams in Modern Ultra High-frequency (Microwave) Devices

There are 13 figures and 36 references, 22 of which are English, 9 Soviet and 5 French.

SUBMITTED: March 6, 1958

1. Microwave equipment---Operation 2. Electron beams---Focusing

Card6/6

AUTHOR: Chernov, Z. S. SOV/30-58-8-14/43

TITLE: Transactions of the International Congress on Superhigh-Frequency Apparatus (Mezhdunarodnyy kongress po priboram sverkhvysokikh chastot)

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 8, pp. 91-94 (USSR)

ABSTRACT: This congress was held in London from May 19-23. It was attended by scientists and engineers from 22 countries. The Soviet delegation consisted of I.Ye. Rogovin, V.A. Sretinskiy, S.I. Rudkovskiy, A.G. Aleksandrov, Z.S. Chernov. In recent years the electronics of superhigh frequencies advanced rapidly. Large groups of scientists from various countries try to determine new principles and to develop equipment for the generation and the amplification of radio frequencies in the range of centimeter and millimeter waves. The report on the amplification and transmitting equipment developed in the Soviet Union based upon the method of centrifugal electrostatic focusing of electron streams found great interest. The Soviet scientists N.G. Basov, A.M. Prokhorov among others dealt with the problem of the [illegible]raction of external high-

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frequency fields and the electrons in solids. The agenda of different committees contained reports on high-frequency phenomena in plasma, on electron optics, on clystrons, magnetrons, measuring methods and on technology. During the congress an exhibition of SVCh (superhigh frequency) apparatus of a number of English firms and laboratories was arranged. Laboratories in London, Cambridge (Kembridzh) and Oxford (Oksford) were visited. These visits revealed that a symposium of English and Soviet scientists concerning problems of the emission of short waves by fast electrons would be useful for both parts. During a reception given by the scientists and engineers of the General Electric Company (Dzheneral elektrik kompani) several hours were spent in an animated discussion. The reduction of equipment noises, a further increase of output and the penetration into the millimeter and sub-millimeter range are considered to be the main problems of present-day superhigh frequency electronics.

CHERNOV, Z. S., KISLOV, V. Y., BOGDANOV, E. V.

"Interaction of Electron Flow with Plasma,"

report presented by Chernov at the 9th Symposium on Millimeter Waves, 31 March - 2 April 1959, Brooklyn Polytech. Inst. New York.

Inst. for Radioelectricity and Electronics, USSR

Abst: The problem of interaction of a limited electron flow with plasma is considered. The dispersion relation is derived and conditions for an increase of microwave signal are analyzed. The main requirements on the system for producing effective interaction in a high frequency region of microwave bands are determined.

Experimental investigations of the system in which modulated electron flow interacts with gas discharge plasma are described. Frequency characteristics of the system and dependence of the microwave signal of electron density in plasma defined by a discharge current are given.

CHERNOV Z. S.

11 июня

(с 18 до 22 часов)

Г. И. Рапопорт

Возбуждение волновода электронными пучками с периодически изменяющимися траекториями.

С. Г. Афанасьев

Об управлении частотой триодного генератора.

А. Н. Чекин

Низкочастотные шумы современных электронных ламп.

М. С. Аралов

Метод получения нелинейных анодно-сеточных характеристик выпуклых форм в многосеточных электронных лампах

12 июня

(с 10 до 16 часов)

Е. В. Богданов,
В. Я. Кислов,
З. С. Чернов

Взаимодействие электронного потока с плазмой.

Г. Д. Лобов

Гетеродинный детектор СВЧ колебаний

А. И. Быстров,
И. Н. Залогин,
С. С. Шахназаров

Волноводные умножители частоты на релятивистских электронных пучках.

А. М. Харченко,
К. В. Белозерский,
М. И. Елинсон,
Д. В. Зернов

Электронные контактные лампы и некоторые возможные схемы их применения

8. СЕКЦИЯ РАДИОИЗМЕРЕНИЙ

Руководитель Г. Д. Бурдун

9 июня

(с 10 до 16 часов)

А. Г. Смагин

О перспективах повышения стабильности кварцевых генераторов для эталонов частоты

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNORIE), Moscow, 8-12 June. 1959

9.3150,9.3240

77775
SOV/109-5-2-8/26

AUTHORS: Bogdanov, E. V., Kislov, V. Ya., Chernov, Z. S.

TITLE: Electron Flux Interaction with Plasma

PERIODICAL: Radiotekhneka i elektronika, 1960, Vol 5, Nr 2, pp 229-238 (USSR)

ABSTRACT: The interaction of a finite electron beam with plasma is analyzed and the dispersion equation is derived. A system is tested experimentally in which a modulated electron beam interacts with plasma of a gaseous discharge within a longitudinal magnetic field. Amplification was achieved up to 40 db within the range of 3 to 30 cm waves. (1) Interaction of a finite modulated electron flux with plasma. Existing theories concerning the interaction of an infinite flux with an infinite plasma being too abstract, the authors assume a cylindrical electron flux of diameter a piercing an infinite plasma in the direction of z-axis. Assuming further that current densities and electron velocities in the beam and in the plasma have only longitudinal components,

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while variable components are proportional to $e^{i(\omega t - \gamma z)}$ the polarization potential will be expressed by

$$\frac{\partial^2 \Pi}{\partial r^2} + \frac{1}{r}\frac{\partial \Pi}{\partial r} + \frac{1}{r^2}\frac{\partial^2 \Pi}{\partial \vartheta^2} + T^2 \Pi = 0, \qquad (2)$$

WHERE

$$T^2 = (\gamma^2 - k^2)\left[\frac{\omega_p^2}{\omega^2} + \frac{\omega_{pe}^2}{\omega^2\left(1 - \frac{1}{\gamma_e}\right)^3} - 1\right], \qquad (3)$$

where γ is the wave number in medium, k is the wave number in vacuum, γ_e is the electron wave number; ω_{pe} is different from zero when $r \leq a$. Dividing the space into two areas, one of which ($0 \leq r \leq a$) contains the electron flux and plasma, while the other ($r \geq a$) contains only plasma, and joining the solutions

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at the boundary of the beam r = a, dispersion equations are obtained

$$Ta\frac{J_1(Ta)}{J_0(Ta)} = \tau a\frac{H_1^{(2)}(\zeta a)}{H_0^{(2)}(\zeta a)}, \quad (4)$$

WHERE

$$\tau^2 = (\gamma^2 - k^2)\left(\frac{\omega_p^2}{\omega^2} - 1\right). \quad (5)$$

IF $\tau^2 > 0$,

AND

$$Ta\frac{J_1(Ta)}{J_0(Ta)} = \tau_1 a\frac{K_1(\tau_1 a)}{K_0(\tau_1 a)}, \quad (6)$$

when $\tau_1^2 > 0$, where $\tau_1^2 = -\tau^2$, $H_0^{(2)}$ is Hanckel's function of the zero order and 2-nd kind, corresponding to a wave leaving the electron flux; K_o is modified Bessel's function. The authors limit themselves to an

analysis of waves with phase velocity of near v_e. From Eqs. (4) and (6) they find the dependence of Ta on τa, permitting the derivation of the propagation constant and of its imaginary part. The amplification per unit length of system is expressed by a simple equation

$$G_e = 8{,}69\gamma_{pe}q \ db/m \qquad (7a)$$

where $\gamma_{pe} = \omega_{pe}/v_e$ is the plasma wave number of the electron flux. At the boundary of the plasma (Z = 0) the variable component of the current density of the space charge waves in the stream is j(0) = 0, and the variable velocity v(0) is maximum. Two waves are generated in the system plasma -- electron stream; one is attenuated, the other is amplified. Therefore, the coefficient of amplification is

$$G = (8{,}69\gamma_{pr}ql - 3)\,db \qquad (76)$$

where l is length of the interaction zone. A graphic representation of quantity q is given in Fig. 1. The method of calculating quantity $q(\gamma_e a, \omega_p/\omega)$ is explained in an appendix to this article. The most important relation is that of the amplification to ω_p^2/ω^2, or, if amplification at a given frequency is considered, the relation to n/n_o where n_o corresponds to plasma resonance for the given frequency. If $n < n_o$, there is no amplification. Beginning with $n = n_o$ the amplification rises abruptly, but it declines slowly with a further increase of n. A strict statistical analysis is given in Appendix 2. As a result of this analysis in Eqs. (4) and (6) thermal terms appear

$$T^2 = (\gamma^2 - k^2)\left[\frac{\omega_{pe}^2}{\omega^2\left(1-\frac{1}{\gamma_e}\right)^2} - \frac{\omega_p^2}{\omega^2\left(1-\frac{\gamma^2 v_T^2}{\omega^2}\right)} - 1\right]. \quad (8)$$

$$T^2 = (\gamma^2 - k^2)\left[\frac{\omega_p^2}{\omega^2\left(1-\frac{\gamma^2 v_T^2}{\omega^2}\right)} - 1\right]. \quad (9)$$

Consideration of thermal terms is very important in case of resonance (for large $\gamma_e a$). If $\gamma_e a \to \infty$, practically a plane condition is achieved when the dependence of Π on the radius disappears, and the dispersion equation takes on the shape $T^2 = 0$ (A. I. Akhiyezer, Ya. B. Faynberg, Zh E T F, 1957, 21, 1262). It is doubtful whether such a case can be achieved practically. Amplification of the usual types of T/T drops at shorter wavelengths in consequence of an increase of γa for the delay structure. In plasma the amplification increases with γa, and it is

Electron Flux Interaction with Plasma

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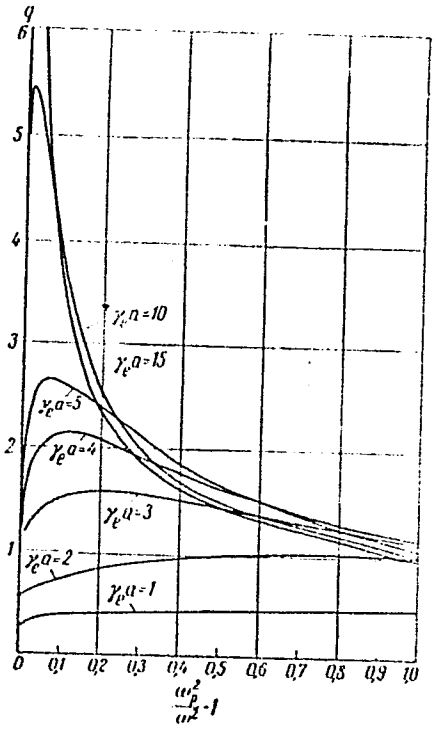

Card 7/13 Fig. 1.

possible to achieve a more effective interaction at higher frequencies and greater electron stream cross sections. Plasma concentrations must exceed the critical magnitude, which is calculated by Langmuir's formula. (2) Experimental study of electron beam interaction with plasma. This study was carried out using a device shown in Fig. 2.

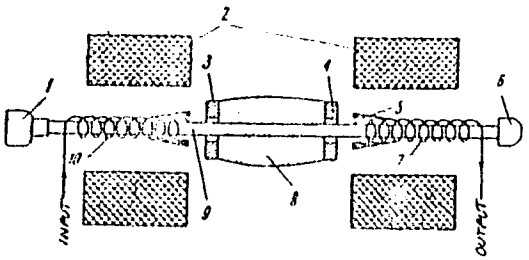

Fig. 2. Schematic Diagram of the experimental device: (1) electron gun; (2) magnet coils; (3) cathode; (4) anode; (5) absorber; (6) collector; (7) demodulating helix; (8) plasma; (9) electron beam (10) modulating helix.

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The discharge gap consisted of an annular heated oxide coated cathode facing an annular anode. Between these electrodes a discharge in mercury vapors at a few micron pressure was ignited. The current could be varied between zero and a few amperes. The magnetic coils imposed a field in the discharge area like those used in plasma traps with magnetic stoppers. Amplification from 20 to 40 db was achieved at a discharge current of 100 to 200 ma and a beam current under 1 ma. Figure 3 shows the dependence of an increasing q on the square of plasma frequency $\omega_p^2/\omega^2 - 1$. Solid curves are calculated quantities, while the dashed line is experimental. Figure 4 shows a most important dependence indicating that the use of plasma for amplification of millimeter waves is possible. Along the ordinate axis the signal frequency in kilomegacycles is plotted, while the maximum amplification current density of the discharge is plotted on the abscissa. Figure 5 shows the pace of amplification depending on the current density of the discharge and different wave lengths

Electron Flux Interaction with Plasma

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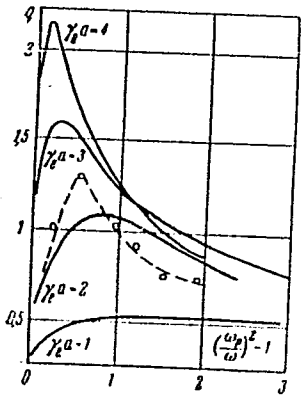

Card 10/13 Fig. 3.

Electron Flux Interaction with Plasma

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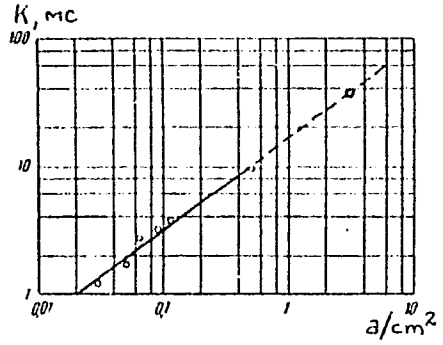

Card 11/13 Fig. 4.

which coincides with the theoretical predictions about critical frequencies (knees of curves). The article contains an appendix, where are given (1) Derivation of the dispersion equation, (2) an analysis of it, (3) calculation of thermal scattering. There are 7 figures; 9 references, 5 Soviet, 4 U.S. The U.S. references are D. Bohm, E. B. Gross, Phys. Rev., 1949, 75, 1851; M. A. Lampert, J. Appl. Phys., 1956, 27, 5; G. D. Boyd, L. M. Field, R. W. Gould, Phys. Rev., 1958, 109, 1393; C. K. Birdsell, J. R. Whinnery, J. Appl. Phys., 1953, 24, 314.

SUBMITTED: May 21, 1959

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Electron Flux Interaction with Plasma

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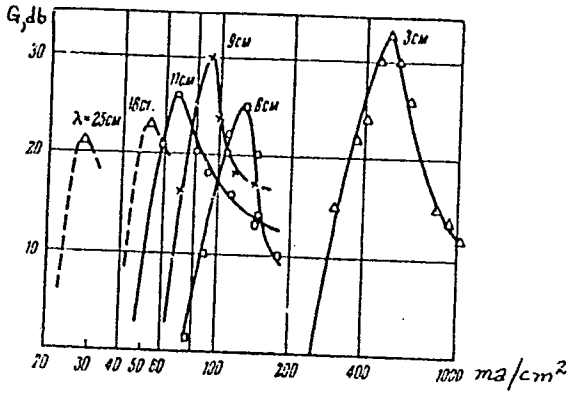
SOV/109-5-2-8/26



Card 13/13 Fig. 5.

BERNASHEVSKIY, G.A., kand. tekhn. nauk, red.; CHERNOV, Z.S., kand. tekhn. nauk, red.; YAKIMENKO, L.P., red.; POTAPENKOVA, Ye.S., tekhn. red.

[Superhigh-frequency oscillations in a plasma] Kolebaniia sverkhvysokikh chastot v plazme; sbornik statei. Moskva, Izd-vo inostr. lit-ry, 1961. 358 p. (MIRA 14:10)

(Plasma oscillations)

CHERNOV, Z. S., BERNASHEVSKI, G. A.

"Amplification of Microwaves by Means of Plasma"

paper presented at The Symposium for Electromagnetics and Fluid Dynamics of Gaseous Plasma at Polytechnic Institute of Brooklyn, April 1961.

CHERNOV, Z. S.; BERNASHEVSKIY, G. A.

" Resonance and Fluctuation Phenomona Accompanying Microwave Amplification in the Plasma Electron Beam System "
Presented at the conference on Physical Electronics at the Massachusetts Inst. Of Tech., March 23rd 1962.

BERNASHEVSKI, Grig A.; CHERNOV, Z. S.

"Transient Processes in Beam Masers"

Report submitted for the 4th International Congress on Microwave Tubes, Scheveningen, the Netherlands, 3-7 Sep '62

45281

Z/037/62/000/005-6/043/049
E140/E520

AUTHORS: Bernashevskiy, G. A. and Chernov, Z.S.

TITLE: The resonance properties and fluctuations due to high-frequency oscillation amplification in a plasma-electron beam system

PERIODICAL: Československý časopis pro fysiku, no.5-6, 1962, 686-690

TEXT: A study is made of the resonance and fluctuation properties of a plasma-electron beam system in a longitudinal magnetic field. It is found that the experimentally determined resonance properties are less well defined than the theory predicts. A hypothesis is derived that the fluctuations in the electron beam are important in determining the amplitude of the noise level in the system and that the plasma fluctuations themselves have only a small influence. The measurements are carried out in mercury vapour at room temperature at a frequency of 9500 Mcs, with heated cathode 0.4 cm^2. The discharge column is 4 cm long, with a 2 kV electron beam 1.5 mm in diameter. Under these conditions the noise fell into a band "several Mcs" wide.

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The resonance properties and ... Z/037/62/000/005-6/043/049
E140/E520

There are 8 figures.

ASSOCIATION: Ústav radiotechniky a elektroniky, AV SSSR, Moskva
(Institute of Radioengineering and Electronics,
AS USSR, Moscow)

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L 10296-63 EWT(1)/EEC(b)-2/ES(w)-2/
BDS--AFFTC/ASD/ESD-3/SSD--Pab-4--IJP(C)
ACCESSION NR: AP3000995 S/0109/63/008/006/0973/0984

AUTHOR: Chernov, Z. S.; Bernashevskiy, G. A.

TITLE: Propagation of space-charge-density waves and bunching of electrons in rotating electron beams focused by the centrifugal electrostatic method [Report of the Fourth World Congress on SHF Electronic Devices held in The Hague, September 1962]

SOURCE: Radiotekhnika i elektronika, v. 8, no. 6, 1963, 973-984

TOPIC TAGS: electron resonator, electron waveguide

ABSTRACT: A mathematical description is offered, in both linear and nonlinear approximations, of the propagation of high-frequency oscillations in the direction of rotation of an electron beam focused by centrifugal-electrostatic means. It is pointed out that such a beam is in fact an active electron waveguide capable of amplifying oscillations. Nonlinear phenomena in an "antiklystron" (an electron resonator with centrifugal-electrostatic focusing) are analyzed by the method of specified field. Experiments confirmed the existence of a growing wave in the above electron waveguide and demonstrated that the electron resonator can operate as an oscillator and as a regenerative amplifier. The experimental resonator is

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ACCESSION NR: AP3000995

shown in Fig. 9 (Enclosure 1) and some of its amplification characteristics, in Fig. 10 and Fig. 11 (Enclosure 2). "In conclusion, the authors are using this opportunity to thank L. A. Vaynshteyn for his attention to the above investigation, and particularly for his advice to investigate in greater detail the equivalence between the model described by the equations (11) and the travel of a point charge in a cylindrical capacitor." Orig. art. has: 15 figures, 23 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 5Nov62 DATE ACQD: 01Jul63 ENCL: 02

SUB CODE: 00 NO REF SOV: 003 OTHER: 006

Card 2/42

CHERNOV, Z. S., doktor tekhn. nauk

Development of superhigh-frequency electronics. Vest. AN SSSR 33 no.1:70-72 Ja '63. (MIRA 16:1)

(Electronics—Congresses)

BERNASHEVSKIY, G.A.; BOGDANOV, Ye.V.; KIKIN, V.Ya.; CHELNOV, Z.S., prof.; MASHAROVA, V.G., red.

[Plasma and electronic microwave amplifiers and generators] Plazmennye i elektronnye usiliteli i generatory SVCh. Moskva, Sovetskoe radio, 1965. 94 p. (MIRA 18:9)

ACC NR: AM6006280 Monograph UR/

Bernashevskiy, G. A.; Bogdanov, Ye. V.; Kislov, V. Ya.; Chernov, Z. S.

Plasma and electron amplifiers and superhigh frequency oscillators (Plazmennyye i elektronnyye usiliteli i generatory SVCh) Moscow, Izd-vo "Sovetskoye radio", 65. 0094 p. illus., biblio. 10,300 copies printed.

TOPIC TAGS: ionized plasma, electron plasma, microwave plasma, plasma electromagnetic wave, plasma beam interaction, plasma device, plasma electron oscillation, plasma waveguide, traveling wave tube, backward wave tube, superhigh frequency, SHF amplifier, SHF oscillator, electron beam

PURPOSE AND COVERAGE: Some new methods for amplification and generation of superhigh frequency (SHF) oscillations using electron-ion plasma penetrated by an electron beam and also using a rotating electron beam are considered. In contrast to the usual SHF devices, where the electron beam interacts with electromagnetic fields which are channeled by metallic structures, in plasma SHF devices plasma having a number of new properties is used as the medium channeling the electromagnetic oscillations. The physical principles in utilizing plasma for the generation and amplification of SHF oscillations and the interaction of plasma oscillations with an electron beam are considered in the first part of the book.

Card 1/3 UDC: 621.385.6

ACC NR: AM6006280

The basic properties of the interaction which can be used for constructing plasma amplifiers and oscillators are developed. The results of theoretical and experimental studies of plasma amplifiers and oscillators are presented. In the second part centrifugal-electrostatic focusing (CEF) of rotating electron beams is considered. New SHF amplifiers and oscillators, constructed on the basis of this focusing and having a number of advantages over other electron SHF devices, are also discussed. The stability of an electron beam when utilizing CEF is analyzed and the current limit is determined. Experimental studies of traveling-wave tubes (TWT) and backward-wave tubes (BWT) with central electrostatic focusing are described. The processes of high frequency bunching in a rotating electron beam are considered in linear and nonlinear approximations and it is shown that space-charge self-bunching of the electrons is possible. The book is intended for scientific workers and engineers working in the field of construction and study of electron SHF devices and for graduate and other advanced students of the corresponding specialties. [Abstracter's note: There are 95 references listed on pp. 55-58.]

TABLE OF CONTENTS:

Card 2/3

ACC NR: AM6006280

[Abstracter's note: There are 95 references listed on pp. 55-58.]

SUB CODE: 20, 09/ SUBM DATE: 08Jul65/ ORIG REF: 010/ OTH REF: 016

Card 3/3

CHERNOV-GRUZDEV, Yu. A. Cand Tech Sci -- "Compiling and editing of a complex regional agricultural map (According to the example of Gremyachenskiy Rayon of the Voronezhskaya Oblast)." Voronezh, 1958. (Min of Agr USSR. Voronezh Agr Inst). (KL, 1-61, 198)

AUTHOR: Chernov-Gruzdev, Yu. A. SOV/6-58-9-9/26

TITLE: Possibilities of Using Acrylate in Plane Table Surveying (Vozmozhnosti ispol'zovaniya akrilata pri menzul'noy s"yemke)

PERIODICAL: Geodeziya i kartografiya, 1958, Nr 9, pp 48 - 5o (USSR)

ABSTRACT: Plane table pads are best made of transparent plastic materials giving only little way to deformation and exhibiting good properties for drawing upon them. Such a substance is acrylate (colorless organic glass), having a relatively small density, high strength, a particularly high transparency and a low flammability. In the USSR, acrylate comes in sheets of different thickness and dimensions. In plane table surveying sheets 60 x 60 cm in size and with a thickness of 0,5 - 0,8 mm should be used. They are fastened to the corners of the plane table by means of wood-screws, the plane table being previously coated with enamel lacquer. Surveying proceeds in the usual manner. The author carried out experiments

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in order to establish the amount and the character of deformations of plane tables covered with acrylate sheets. It appeared that at temperatures ranging from 5 to 10° the deformations of acrylate keep within the accuracy of graphic tracing. Hence the geometric arrangement of the map elements is not distored. Attempts to use another plastic material, "Viniproz S" showed that it is unsuited for this purpose. The use of transparent plastic materials on plane tables leads to a saving of time and of costs and increases the quality of maps.

ONIKIYENKO, V.V., CHERNOV-GRUZDEV, Yu.A.

Agricultural atlas of the Ukrainian S.S.R. Geod. i kart. no.4:77-80 Ap '60. (MIRA 13:8)

(Ukraine--Agriculture--Maps)

USSR / Diseases of Farm Animals. Diseases Caused by Bacteria and Fungi. R-1

Abs Jour: Ref Zhur-Biol., No 2, 1958, 7282

Author : A. A Chernova
Inst : Ivanovsky Agricultural Institute
Title : Problems of the Pathogenesis of Leptospirosis of Large and Small Horned Cattle.

Orig Pub: Sb. nauchn. tr. Ivanovsk. s-kh. in-ta, 1956, vyp. 15, 115-126.

Abstract: On the basis of personal and literary data, the author attempts to build a complete picture of the pathogenesis of leptospirosis. The prodromal period of the disease is characterized by leptospiemia. The contact of the causal agent with the nervous receptors at the opening of the infection and in the vascular system leads to

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USSR / Diseases of Farm Animals. Diseases Caused by Bacteria and Fungi. R-1

Abs Jour: Ref Zhur-Biol., No 2, 1958, 7282

Abstract: disintegration of leptospira and tissue elements The following have been observed: intermittent fever, depression or excitement, sometimes - nervous symptoms. The disturbance of the vasomotor functions and the organic changes of the vascular walls condition the exudative (serous) character of the inflammatory process, developing in the organs and tissues, and the edema of all the connective tissues throughout the organism. Changes in the blood intensity. With injury to the liver hemolytic jaundice assumes a hemolytico-heptogenic character. Along with the intensification of the symptoms of proliferation of the RES, the fermentative functions of the latter become depressed, in particular the function of

Card 3/5

USSR / Diseases of Farm Animals. Diseases Caused by Bacteria and Fungi. R-1

Abs Jour: Ref Zhur-Biol., No 2, 1958, 7282

Abstract: development in many animals of progressive ca nexia. The author considers the data presented as far from exhausting the question of the pathogenesis of leptospirosis and emphasizes the need for a profound study of the role of the nervous system in the development of this disease.

Card 5/5

Country : USSR
Category : Farm Animals. Cattle. 4-2
Abs. Jour : Ref Zhur-Biol., No 14, 1958, 74002

Author : Chernova, A. A.
Institut. : Ivanovo Institute of Agriculture.
Title : Morphologic Changes of the Lower Abdominal Wall during Pregnancy in Cows (Preliminary Report).

Orig Pub. : Sb. nauchn. tr. Ivanovsk. s.-kh. in-ta, 1956, vyp. 15, 385-394
Abstract : All layers of the lower abdominal wall were studied in 30 pregnant cows at various stages of pregnancy. The earliest changes were found to exist in the lower abdominal wall in the course of the 3rd month of pregnancy. During the 3-7 month period of pregnancy, impairments of blood circulation which manifest themselves in hyperemia, erythrodiapedesis and new capillary formation, and which are accompanied by edema of the skin, of intramuscular and interfascial septa and of the peritoneum are most

Card: 1/3

Country : USSR
Category : Farm Animals.
Cattle. Q-2
Abs. Jour : Ref Zhur-Biol., No 14, 1958, 74002

Author :
Institut. :
Title :

Orig Pub. :

Abstract : marked. The course of blood vessels and nerve trunks is found to reveal proliferation of adventitial histiocytes, lymphocytes, and plasmocytes. At the 8-9 month period of pregnancy, side by side with proliferation processes, lesion processes are also observed - degeneration and necrosis of RES [reticulo-endothelial system] cells, hyalinosis of some blood vessels, thining of the epidermis, deformation and, at places, rupture of collagen and elastic

Card: 2/3

22

Country : USSR
Catogory : Farm Animals.
C Cattle. 4-2
Abs. Jour : Ref Zhur-Biol., No 16, 1958, 74002
Author :
Institut. :
Title :

Orig Pub. :

Abstract : structures in the skin itself, in the fascial-aponeurotic layer, and in the peritoneum. The proliferation of RES cells, hyperemia and the new formation of capillaries in the abdominal wall of pregnant cows are apparently a manifestation of the general defense reaction of the organism. The intensification of blood circulation assists in the augmentation of elasticity of collagen and the elastic structures which is important in cases of increased interabdominal pressure.

Card: 3/3

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Malignant neoplasms of the skin of the eyelids as revealed by data of the Stalino Medical Institute Department of Eye Diseases. Oft.zhur. 14 no.5:300-305 '59. (MIRA 12:10)

1. Iz kliniki glaznykh bolezney (zav. - prof.I.F.Kopp) Stalinskogo meditsinskogo instituta.
(EYELIDS--CANCER)

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Treatment of neurogenic keratitis. Vest. oft. 76 no.5:35-39 S-O '63. (MIRA 17:1)

1. Kafedra glaznykh bolezney (zav. - prof. L.B. Zats) Donetskogo meditsinskogo instituta.

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Glycogen content and respiratory activity in the cornea burned by acid. Vop. med. khim. 10 no.4:367-369 Jl-Ag '64. (MIRA 18:4)

1. Kafedra glaznykh bolezney Donetskogo meditsinskogo instituta.

CHERNOVA, Anna Dmitriyevna, spetsialist-defektolog; KUKUYEV, L.A., red.; BUL'DYAYEV, N.A., tekhn.red.

[Restoration of speech in brain diseases] Vosstanovlenie rechi pri zabolevaniiakh golovnogo mozga. Moskva, Gos.izd-vo med.lit-ry Medgiz, 1958. 116 p. (MIRA 13:1)
(BRAIN--DISEASES) (SPEECH THERAPY)

BEYN, E.S.; GERTSENSHTEYN, E.N.; RUDENKO, Z.Ya.; TAPTAPOVA, S.L.; CHERNOVA, A.D.; SHOKHOR-TROTSKAYA, M.K.; KUKUYEV, L.A., red.; KUZ'MINA, N.S., tekhn. red.

[Handbook on the recovery of speech by persons affected with aphasia] Posobie po vosstanovleniiu rechi u bol'nykh afaziei. Pod red. E.S.Bein. Moskva, Medgiz, 1962. 335 p. (MIRA 15:5)

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[Water-power resources of the rivers of the Uzbek S.S.R.] Vodnoenergeticheskie resursy rek Uzbekskoi SSR. Tashkent, Izd-vo AN UzSSR, 1963. 282 p. (MIRA 17:1)
(Uzbekistan—Water power)

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KOMAROV, V.L., akademik; pod nablyudeniyem akademika N.A.Maksimova, B.K.Shishkina, S.Yu.Lipshitsa, A.G.Chernova; KUZNETSOV, B.G., red.; ENCHMEN, E.S., red.; AUZAN, N.P., tekhn.red.

[Selected works] Izbrannye sochineniia. Moskva, Izd-vo Akad. nauk SSSR. Vol.11. 1948. 707 p. (MIRA 11:1)

1. Chlen-korrespondent AN SSSR (for Shishkin).
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(Resins, Synthetic)

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(Phenol condensation products)

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1. Klinika propedevticheskoy terapii pediatricheskogo i sanitarno-gigiyenicheskogo fakul'tetov (zav.-prof. I.T.Stukalo) L'vovskogo meditsinskogo instituta.
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Complex treatment of chronic dysentery in children up to 3 years of age in children's home. Vop.okh.mat.i det. 2 no.3:37-40 My-Je '57. (MLRA 10:7)

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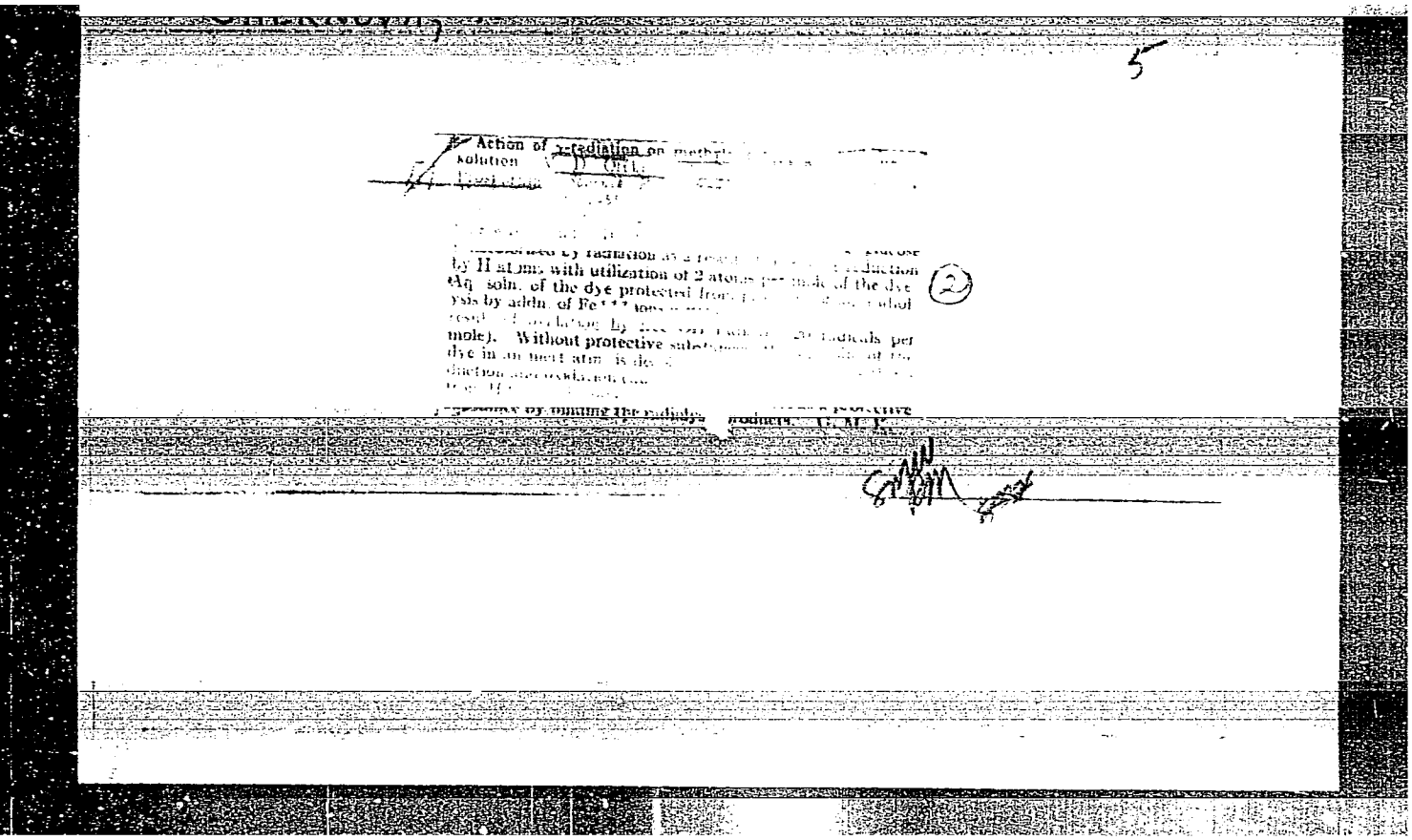
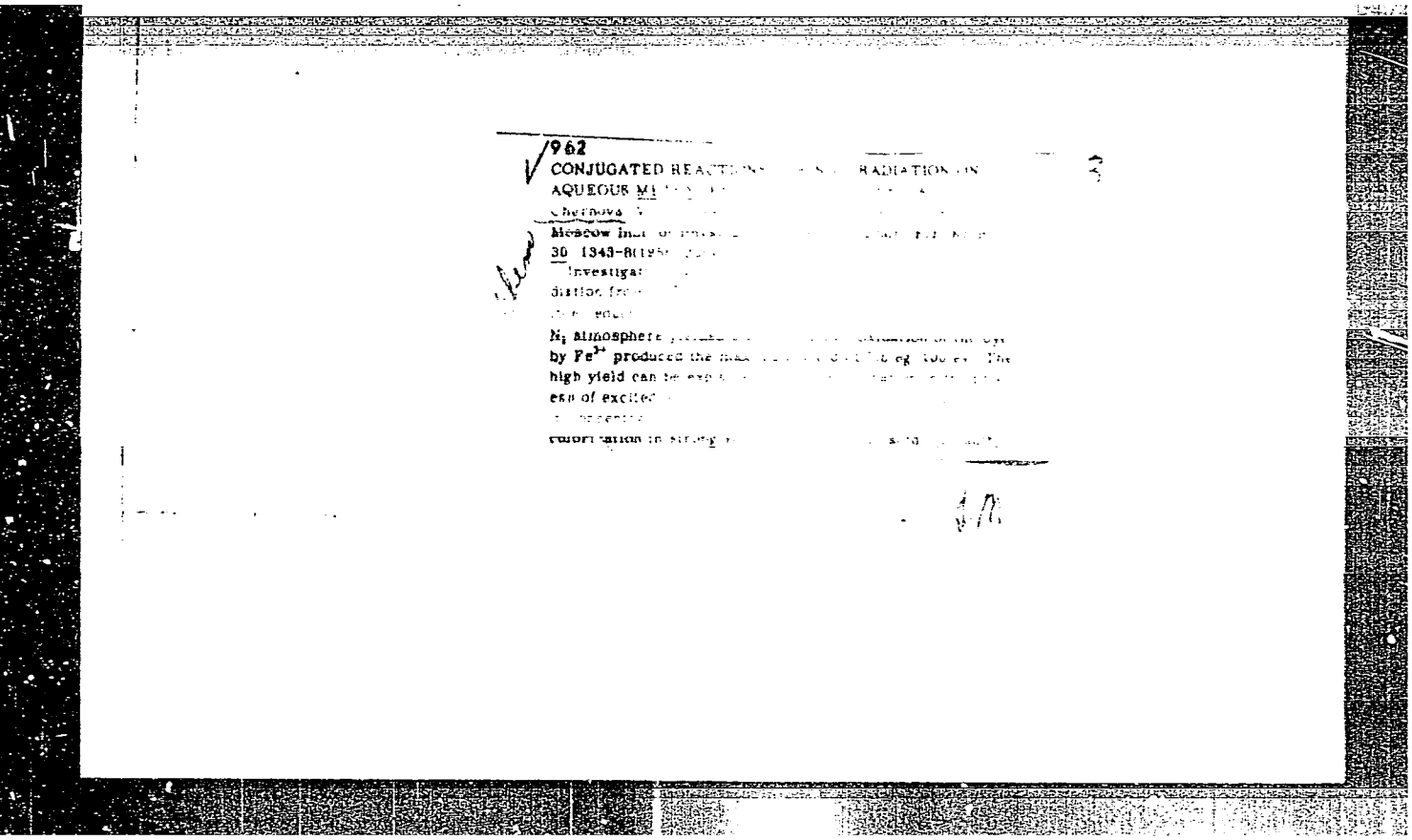
... Moscow 1955,
C.A. 50, 9161e.



Action of x-radiation on methy
solution
by H atoms with utilization of 2 atoms per
aq. soln. of the dye protected from
ysis by addn. of Fe
mole). Without protective
dye in
by uniting the radicals



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CONJUGATED REACTIONS [illegible] RADIATION [illegible]

AQUEOUS MI [illegible]

Cherkova [illegible]

Moscow Inst. of [illegible]

30 1343-8(1958) [illegible]

Investigat[illegible]

diation fro[illegible]

[illegible]

N_2 atmosphere [illegible] by Fe^{3+} produced the [illegible] eg 100 ev. The high yield can be exp[illegible] esp of excited [illegible]

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